

REMARKS

The Examiner is thanked for the performance of a thorough search. Claims 1-21, 23-26, and 28-32 are pending in this application. The amendments to the claims do not add any new matter to this application. Furthermore, the amendments to the claims were made to improve the readability and clarity of the claims and not for any reason related to patentability. All issues raised in the Office Action mailed December 2, 2008 are addressed hereinafter.

I. ISSUES NOT RELATING TO PRIOR ART

A. CLAIM REJECTIONS -- U.S.C. § 101

The Office Action rejected claims 9, 23 and 30 under 35 U.S.C. § 101. (Office Action, page 3)

Applicants believe that the rejection is fully addressed by amended claims 9, 23 and 30. Reconsideration and withdrawal of the rejection is respectfully requested.

II. ISSUES RELATING TO PRIOR ART

A. CLAIMS -- 35 U.S.C. § 102(e): HO

Claims 1-2, 6-11 and 15-18 stand rejected under 35 U.S.C. § 102(e) as allegedly unpatentable over Ho Pub. No. US 2002/0136223 A1 (hereinafter “Ho”). (Office Action, page 4) The rejection is respectfully traversed.

CLAIM 1

Present claim 1 recites:

1. A method of forwarding a tunneled packet having a header identifying a tunnel end point and a payload, in a data communications network, comprising the steps performed at a forwarding node of:

for a forwarding node and a tunnel end point both in the same data communication network and both transmitting tunneled packets using the same data communication protocol;
recognizing a tunneled packet comprising an address directly identifying a neighbor node to the forwarding node as the tunnel end point;
removing the header and
forwarding the payload to the neighbor **node using the address directly identifying the neighboring node and without a lookup of a forwarding address.**

Support for the amendment to claim 1 is provided in paragraph [0043] of the specification.

In the previous Reply, applicants argued that Ho's ATM interface, comprising an "ingress ATM aware LSR" and an "egress ATM aware LSR," is not "**a forwarding node and a tunnel end point both in the same communication network, and both transmitting tunneled packets, using the same data communication protocol,**" where **the forwarding node recognizes a tunneled packet comprising an address directly identifying a neighbor node to the forwarding node as the tunnel and point," "removes the header," and "forwards the payload to the neighbor node using the address directly identifying the neighboring node and without a lookup of a forwarding address,**" as claimed.

The Office Action agrees with applicants that Ho's ATM interface does not recite the above limitations. (Office Action, Response to Arguments Section, page 11) However, the Office Action states that "it is [Ho's] forwarding node 16d of FIG. 2 that performs the above limitations." (Office Action, page 11) This is incorrect.

Ho's forwarding node 16d is a typical MPLS penultimate node and can only act as a typical penultimate node, not as the forwarding node recited in claim 1. Ho's penultimate node 16d forwards a packet to the egress ATM aware LSR. Ho's node 16d allows penultimate hop popping to remove need for extra lookup at an "ATM aware LSR," (Ho: FIG. 2, paragraph

[27], ll. 1-12), not at the penultimate node itself. In Ho, after the penultimate node 16d pops off the outer encapsulating header, it cannot “forward the payload to the neighbor node (node 16b) **using the address directly identifying the neighboring node and without a lookup of a forwarding address,**” as claimed.

As a typical penultimate node, Ho’s node 16d, after removing the header, has to perform further lookups before it can forward the payload to the neighbor node,” which is directly opposite to what is recited in claim 1. In an MPLS network, upon receiving a tunneled packet, a penultimate node must perform two lookups. The first lookup is performed when the penultimate node receives a packet, and requires processing the outer encapsulating IP header to verify that the packet was indeed meant to the penultimate node. The second lookup is performed to determine whether the next node to which the packet needs to be sent is an egress node. In an MPLS network, every node along the path, with the exception of the egress node, performs these two lookups. Therefore, after removing the header (which requires the first lookup), Ho’s penultimate node must perform the second lookup, and cannot “forward the payload to the neighbor node **using the address directly identifying the neighboring node and without a lookup of a forwarding address,**” as claimed.

After removing the outer encapsulating header, Ho’s node 16d must perform the second lookup to determine whether it received an advertisement indicating that the next node is an egress node. The egress node 16b knows that it is the egress node because it is manually or automatically configured to know that. However, a penultimate node 16d for a particular LSP does not know that it is the penultimate node unless it receives an advertisement from the egress node 16b. The egress node 16b needs to send to the penultimate node 16d an advertisement with an implicit-null label for a given FEC. The information from the advertisement is recorded in the penultimate node’s RIB, and needs to be looked up before the penultimate node 16d can forward the payload to the egress node 16b. Therefore, after removing

the outer encapsulating header, Ho's penultimate node 16d cannot forward the payload to the egress node unless it performs the second lookup. This is opposite to what is recited in claim 1.

Ho does not teach or suggest more than one level of encapsulation, and thus requires only one tunnel endpoint, which is not required by claim 1. Ho teaches that only one tunnel is established for a particular packet path, and the tunnel endpoint is the egress node 16b. (Ho: FIG. 2; paragraph [28]) Thus, Ho has only one tunnel endpoint 16b and only one penultimate node 16d. In Ho, only one penultimate node 16d can forward the packet to the tunnel end point 16b. Therefore, Ho teaches that no other node besides the egress node 16b can be a tunnel end point. Further, Ho teaches that no other node besides the penultimate node 16d can forward the packet to the tunnel end point.

In contrast to Ho, claim 1 recites that **any node**, not just an egress node, **can be a tunnel end point**, and thus, contrary to Ho, claim 1 allows multiple layers of encapsulation along a path. Further, in contrast to Ho, claim 1 recites that **any node**, not just a penultimate node, **can be a forwarding node**. Moreover, in contrast to Ho, claim 1 recites that any forwarding node, after **“removing the header identifying the tunnel end point, forwards the payload to the neighboring node using the address directly identifying the neighboring node and without a lookup of a forwarding address.”** Thus, according to claim 1, any forwarding node, after removing the header identifying the tunnel end point, without any further lookups, forwards the payload to the next node, which does not have to be an egress node.

Further, according to claim 1, there may be a number of forwarding nodes and a number of tunnel end points along one path, forming a set of sequentially concatenated tunnels within the path. Each of the forwarding nodes recited in claim 1 can receive a packet encapsulated at a certain level of encapsulation, remove the outer encapsulated header and then forward the payload to the neighboring node (which does not have to be an egress node) without any further lookup. These features are not taught or suggested in Ho.

In the previous Reply, applicants argued that Ho's ingress ATM aware LSR is not a **"forwarding node"** that after **"removing a header,"** directly **"forwards the payload to the tunnel end point using the address directly identifying the neighboring node and without a lookup of a forwarding address,"** as claimed. The Office Action agrees with applicants. (Office Action, Response to Arguments Section, page 11) However, the Office Action states that "it is the forwarding node 16d of FIG.2 that performs the above limitations." (Office Action, page 11) This is incorrect.

As discussed above, Ho's node 16d is a typical MPLS penultimate node and thus, after removing the outer encapsulating header, it must perform further lookups before it forwards the packet to the egress node. (See above, pages 14-15) Further, as discussed above, without performing a lookup, after removing the outer encapsulating header, the penultimate node 16d would not know that the next node is an egress node, would not perform penultimate hop popping and would not remove the need for extra lookup at the egress ATM aware LSR. (Ho: FIG. 2) Therefore, as discussed above, Ho's penultimate node 16d is not the **forwarding node** as recited in claim 1.

In the previous Reply, applicants argued that Ho's ingress ATM aware LSR and the neighboring MPLS nodes are not a **"forwarding node and a tunnel end point,"** where **the forwarding node recognizes a tunneled packet comprising an address directly identifying the neighbor node to the forwarding node as the tunnel end point, removes any header,"** and **"forwards the payload to the tunnel end point using the address directly identifying the neighboring node and without a lookup of a forwarding address,"** as claimed. The Office Action agrees with applicants. (Office Action, Response to Arguments Section, pages 11-12) However, the Office Action states that "MPLS node 16d of FIG.2 is a forwarding node and the egress ATM aware LSR 16b is the tunnel end point that performs the above steps. (Office Action, pages 11-12) This is incorrect.

As discussed above, Ho's node 16d is a typical MPLS penultimate node and thus, after removing the outer encapsulating header, it must perform further lookups before it forwards the packet to the egress node. Thus, Ho's node 16d is not the “**forwarding node that, after removing the header, forwards the payload to the neighbor node using the address directly identifying the neighboring node and without a lookup of a forwarding address,**” as recited in claim 1. (See above, pages 14-15)

In a previous Reply, applicants established that Ho's egress ATM aware LSR is not a “**forwarding node**” that after “**removing a header,**” directly “**forwards the payload to the tunnel end point using the address directly identifying the neighboring node and without a lookup of a forwarding address,**” as claimed. The Office Action agrees with applicants. (Office Action, Response to Arguments Section, page 13) However, the Office Action states that the penultimate node 16d of FIG.2 performs the above limitations.” (Office Action, page 13) This is incorrect.

As discussed above, Ho's node 16d is a typical MPLS penultimate node and thus, after removing the outer encapsulating header, it does perform further lookups before it forwards the packet to the egress node. (See above, pages 14-15) Therefore, as discussed above, Ho's penultimate node 16d is not the “**forwarding node**” that after “**removing a header,**” directly “**forwards the payload to the tunnel end point using the address directly identifying the neighboring node and without a lookup of a forwarding address,**” as claimed.

Therefore, claim 1 recites one or more features that are not described in Ho. Thus, anticipation is unsupported, and reconsideration and withdrawal of the rejection is respectfully requested.

CLAIMS 9-10 AND 18

Claims 9-10 and 18 recite features similar to those in claim 1. Therefore, reconsideration and withdrawal of the rejection is respectfully requested for the same reasons described for claim 1.

B. CLAIMS -- 35 U.S.C. § 103(a): HO, AKAHANE

Claims 3-5, 12-14, 19-21, 23-26 and 28 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Ho Pub. No. US 2003/0053414 A1 (hereinafter “Akahane”). (Office Action, page 6) The rejection is respectfully traversed.

CLAIMS 19, 23-24 AND 28

Claims 19, 23-24 and 28 recite features similar to those in claim 1, and Ho does not teach or suggest the whole subject matter of claim 1 because, as discussed above, none of Ho’s nodes is the “**forwarding node**” that after “**removing a header**,” directly “**forwards the payload to the tunnel end point using the address directly identifying the neighboring node and without a lookup of a forwarding address**,” as claimed. Further, Akahane does not cure the deficiencies of claim 1. Therefore, reconsideration and withdrawal of the rejection is respectfully requested for the same reasons described for claim 1.

DEPENDENT CLAIMS

The claims that are not discussed above depend directly or indirectly on the claims that have been discussed. Therefore, those claims are patentable for the reasons given above. In addition, each of the dependent claims separately introduces features that independently render the claim patentable. However, due to the fundamental differences already identified, and to expedite positive resolution of the examination, separate arguments are not provided for each of the dependent claims at this time.

III. CONCLUSIONS

It is respectfully submitted that all of the pending claims are in condition for allowance and the issuance of a notice of allowance is respectfully requested.

If any applicable fee is missing or insufficient, the Commissioner is authorized throughout the pendency of this application to charge any applicable fee to our Deposit Account No. 50-1302.

Bryant, Serial No. 10/620,866 filed 07/15/2003
GAU 2619, Examiner A. Sol
Reply to Office Action

The Examiner is invited to contact the undersigned by telephone if the Examiner believes that such contact would be helpful in furthering the prosecution of this application.

Respectfully submitted,
HICKMAN PALERMO TRUONG & BECKER LLP

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